AMENDMENTS TO THE SPECIFICATION:

The following paragraph replaces all prior versions of paragraph 0005 in the application:

[0005] The present invention seeks to provide an improved multiple beam laser beam energy delivery system, for simultaneously delivering multiple beams of focused laser energy to a substrate, that avoids the use of an f-2 f-theta (f-θ) scan lens.

The following paragraph replaces all prior versions of paragraph 0016 in the application:

[0016] There is thus provided in accordance with still another embodiment of the present invention an apparatus and method for delivering laser energy to an electrical circuit substrate, including at least one laser beam source simultaneously outputting a plurality of laser beams; a plurality of independently steerable laser beam deflectors disposed between the at least one laser beam source and the electrical circuit substrate to direct the plurality of laser beams to impinge on the electrical circuit substrate at independently selectable locations; and focusing optics operative to focus the plurality of laser beams to different independently selectable locations without f-2 f-theta (f-θ) optical elements.

The following paragraph replaces all prior versions of paragraph 0093 in the application:

[0093] As known in the art, presence of the acoustic wave 38 in crystal member 34, when beam 23 impinges thereon, causes beam 23 to be deflected at an angle $2_n\underline{theta}_n(\theta_n)$, relative to an axis incidental with an axis of an input beam, which is a function of the frequency f_n of wave 38, according to the formula:

The following paragraph replaces all prior versions of paragraph 102 in the application:

[00102]   Beam segments 50 are depicted in FIG. 1A as being solid lines. As will be described in greater detail hereinbelow, beam segments 50 may propagate along any of several different beam paths, designated beam paths 51. Paths that are not occupied by a beam segment 50 are depicted in FIG. 1A as dotted lines. Each of the beam segments 50 preferably is independently deflected at an angle $2_n\underline{theta}_n(\theta_n)$ which is a function of an acoustic wave frequency, or frequencies, of the acoustic wave 38 in crystal member 34 at the time a pulse in the laser beam 23 impinges thereon.

The following paragraph replaces all prior versions of paragraph 106 in the application:

[00106]   Progressing now along the optical path downstream of AOD 30, it is seen in FIG. 1A that beam segments 50 are output from AOD 30 such that they lie in a plane,

which is oriented relative to the optical axis of the incoming beam 23. The angles θ_n

theta$_n$(θ_n) at which beam segments 50 are deflected by AOD 30 typically are very small

relative to the optical axis of the incoming beam 23, in the order of 10.sup.-2 radians. In

order to provide for a more compact system, a beam angle expander, such as one or more

telescoping optical elements, schematically represented by lens 60, operative to increase

a separation between beam segments 50, is provided downstream of AOD 30.

The following paragraph replaces all prior versions of paragraph 117 in the application:

[00117]   It is noted that AOD 30 has a cycle time which is shorter than the

time interval between consecutive pulses 24 and 25 of laser beam 22. In other words, the

time required to reconfigure the acoustic wave 38 in AOD 30 to comprise a different

composition of frequencies when impinged upon by the laser pulse 25, so as to change at

least one of the number of beam segments 50 and the respective directions thereof upon

output from AOD 30, is less than the time separation between consecutive pulses 24 and

25 in beam 22. Consequently, the number of beam segments 50 and the direction, θ_n

theta$_n$(θ_n), of each of beam segment 50 can be changed, thereby to select corresponding

pairs of beam focusing modules 74 and steering modules 54, in less time than the time

interval separating pulses 24 and 25. A preferred embodiment of an AOD 30 outputting a

selectable number of beam segments 50, and controlling a direction of each beam

segment 50, is described hereinbelow in greater detail with reference to Figs 3A – 3C.

The following paragraph replaces all prior versions of paragraph 120 in the

application:

[00120]   It is noted that a feature of above described arrangement is the absence of

intervening f-? f-theta (f-θ) optics, or other scan optics, between the beam steering

modules 54 in the variable deflector assembly 52 and substrate 14. Together, beam

segments 50 passing through the collection focusing modules 74 and steering modules 54

cover a target area on substrate 14 that is larger than a sub-target area associated any one

pair of a focusing module 74 and beam steering module 54.

The following paragraph replaces all prior versions of paragraph 121 in the

application:

[00121]   Since no intervening f-?f-theta (f-θ) lens is provided downstream of the

variable deflector assembly 52, in the system seen in Fig. 1A the focus of each beam

segment 50 at substrate 14 is maintained by independently focusing the beam segments

50 upstream of beam steering modules 54. Without upstream focusing before the beam

steering modules 54, a beam segment 50 may not be in focus when delivered to at least

some selectable locations 13 on substrate 14. Loss of focus results, for example, because

the beam segments 50 typically have a finite and small acceptable focus range.

Consequently, the pivoting of reflector 56 in steering modules 54 results in a curvature of

an uncompensated in-focus field, as described hereinbelow. Thus at some selectable

locations on the generally flat surface 17 of substrate 14 there may be a sufficient

increase in distance to cause a loss of focus.

The following paragraph replaces all prior versions of paragraph 125 in the application:

[0125] Each beam segment 50 is deflected at a selectable angle $\cancel{\theta_n}\underline{\text{theta}_n}(\theta_n)$, that is a

function of the frequency or frequencies of the acoustic wave 38. Because the angles of

deflection are relatively small, beam segments 50 preferably pass through one or more

angle expander lenses 60. The beam segments 50 impinge on a selected mapped section

63 of mapping assembly 62. Each beam segment 50 is directed by an appropriate mapped

section 63 to a corresponding reflector element 66 in parallel beam reflector assembly 64.

Each reflector element 66 is suitably tilted to reflect a beam segment 50 along a generally

parallel beam path 51. Downstream of the reflector assembly 64, each beam segment 50

preferably passes through a zoom lens in the array of zoom lenses 68, a beam shaping

lens in the array of beam shaping lenses 70, and a focusing module 74 in the array of

independently controllable focusing lenses 72 to impinge on a corresponding beam

steering module 54. Each beam segment 50 is then independently steered by a

corresponding beam steering module to impinge on substrate 14 at a selectable location

13. The selectable locations 13 may be selected randomly.